

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

TCHEFUNCTE RIVER COMPLEX

**WATERBODY EVALUATION &
RECOMMENDATIONS**

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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TABLE OF CONTENTS

WATERBODY EVALUATION	4
STRATEGY STATEMENT	4
<i>Recreational</i>	4
<i>Commercial</i>	4
<i>Species of Special Concern</i>	4
EXISTING HARVEST REGULATIONS	4
<i>Recreational</i>	4
<i>Commercial</i>	5
<i>Species of Special Concern</i>	5
SPECIES EVALUATION	5
<i>Recreational/Sportfish</i>	5
<i>Species Assemblages</i>	11
<i>Commercial</i>	14
HABITAT EVALUATION	15
<i>Habitat Evaluation of Tributaries and Headwaters</i>	15
<i>Aquatic Vegetation</i>	15
<i>Substrate</i>	16
CONDITION IMBALANCE / PROBLEM	17
CORRECTIVE ACTION NEEDED	17
RECOMMENDATIONS.....	18
<i>References</i>	18

WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish adequate to maintain angler interest and efforts. Gulf strain striped bass (*Morone saxatilis*) are managed to maintain a put-grow-take recreational fishery and develop a broodstock source (Gulf States Marine Fisheries Commission 2006).

Commercial

Commercial species are managed with statewide regulations to provide for a sustainable fishery.

Species of Special Concern

Species of greatest conservation concern in the Tchefuncte River include: Gulf sturgeon (*Acipenser oxyrinchus desotoi*), paddlefish (*Polyodon spathula*), flagfin shiner (*Pteronotropis signipinnis*), river redhorse (*Moxostoma carinatum*), and the Gulf logperch (*Percina suttkusi*; Holcomb et al. 2015). Louisiana prohibited the take of all sturgeons in 1990. LDWF biologists established a recovery plan for Gulf sturgeon in Louisiana. Critical habitat for the Gulf sturgeon was established in the Pontchartrain Basin. However, it does not extend westward past the Lake Pontchartrain Causeway Bridge to include the Tchefuncte River. The Tchefuncte River has been designated as a Louisiana Natural and Scenic River. Guidelines within this program incorporate strategies that are beneficial to the conservation of Gulf sturgeon and the other species listed above. Examples include prohibition of dredging, channel realignment, stream clearing, and reservoir construction.

EXISTING HARVEST REGULATIONS

Recreational

Recreational fishing regulations may be viewed at:

<http://www.wlf.louisiana.gov/fishing/regulations>

STATEWIDE REGULATIONS BY SPECIES	
FRESHWATER	
Crappie	50 daily per person; no size restriction
Largemouth Bass	10 daily per person; no size restriction
Catfish	100 daily per person, with the following minimums: Note: A maximum of 25 undersize fish of a single or combination of all 3 may be kept within the 100 fish daily creel limit
Channel Catfish	11" minimum TL
Blue Catfish	12" minimum TL

Flathead Catfish	14" minimum TL
Striped Bass	5 daily per person; no more than 2 bass >30"
Lepomis (all sunfish species)	No limit
White Bass	50 daily per person; no size restriction
Freshwater Drum	25 daily per person; 12" minimum TL
Buffalo Fish	25 daily per person; 16" minimum TL
Bowfin	No limit; 16" minimum TL
SALTWATER	
Red Drum	5 daily per person; 16" minimum TL; only 1 > 27" max TL
Black Drum	5 daily per person; 16" minimum TL; only 1 > 27" max TL
Spotted Seatrout	25 daily per person; 12" minimum TL
Southern Flounder	10 daily per person; no size restriction

Commercial

Statewide species and gear specific regulations apply. There are no special regulations for the Tangipahoa River.

Species of Special Concern

Gulf sturgeon – a federally threatened species. Louisiana prohibited the take of all sturgeon species in 1991. It is also illegal in Louisiana to possess a threatened or endangered species. The daily possession limit for paddlefish is two per person per day with a maximum lower jaw fork length of 30 inches.

SPECIES EVALUATION

Recreational/Sportfish

Largemouth Bass –

Relative abundance, structural indices and relative weight

Largemouth bass (LMB) occur throughout the Tchefuncte River Complex and its tributaries. Prior to 2017, LMB electrofishing samples in the spring and fall were inconsistent. Beginning in 2017, fifteen stations are sampled in the summer of every fourth year to evaluate LMB populations. Relative abundance or catch per unit effort (CPUE), length frequency, the structural indices of proportional stock density (PSD), relative stock density (RSD-p), and relative weight (Wr) are calculated for each sample. A summary of electrofishing results from 1990-2017 for stock and quality size fish (Figures 1 and 2) suggests an upward trend in the LMB population in recent years.

The most recent length distributions for largemouth bass collected in the summer of 2017 in the Tchefuncte River are presented in Figure 3. The LMB ranged from 1 to 19 inches' total length (TL). Mean relative weight (Wr) of LMB sampled in 2017 is within the acceptable range (i.e., above 80). Wr is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. LMB mean relative weights below 80 may indicate a potential problem with forage availability.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe size distribution (length-frequency) of the population data (Anderson and Neumann 1996). Proportional stock density compares the number of quality size bass (greater than 12 inches for largemouth bass) to the number of stock size bass (≥ 8 inches in length). The PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals. A population with a low PSD consists mainly of smaller fish.

$$\text{PSD} = \frac{\text{Number of bass} \geq 12 \text{ inches}}{\text{Number of bass} \geq 8 \text{ inches}} \times 100$$

Relative stock density (RSD_p) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches or longer.

$$\text{RSD}_p = \frac{\text{Number of bass} > 15 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

The desirable range for PSD is between 40 and 80. PSD and RSD_p percentages for largemouth bass collected in the Tchefuncte River are low; indicating a population consisting primarily of small individuals with few larger fish available (Figures 4). Though PSD and RSD_p indicate an unbalanced population, trend lines indicate the population is moving in a positive direction. Furthermore, results from 2011 and 2017 CPUE and length frequency point to a population recovery from recent hurricanes, as size groups are now similar to those found in 1990 before the recent storms. Similar results have been reported by LDWF biologists in the southwestern part of Louisiana from rivers impacted by Hurricane Rita. The resilience to rebound following major hurricanes (Katrina 2005, and Gustav 2008) appears to be an adaptive trait inherent of coastal fisheries populations.

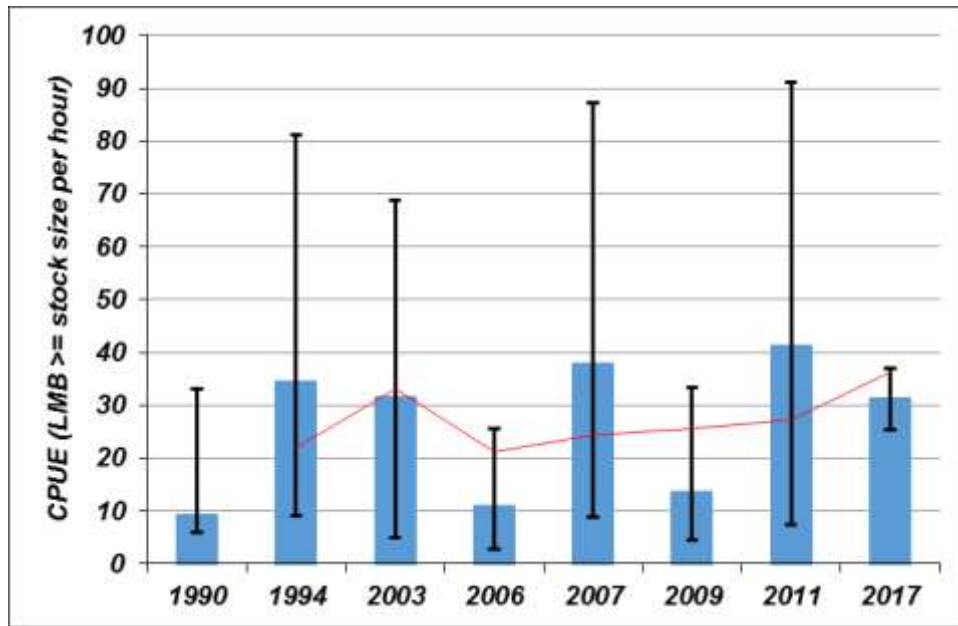


Figure 1. The mean relative abundance ($CPUE \pm SE$) for stock-size LMB collected in electrofishing samples in the Tchefuncte River, Louisiana from 1990 to 2017. * Prior to 2017, samples were collected in the spring and fall. The 2017 sample were collected in the summer.

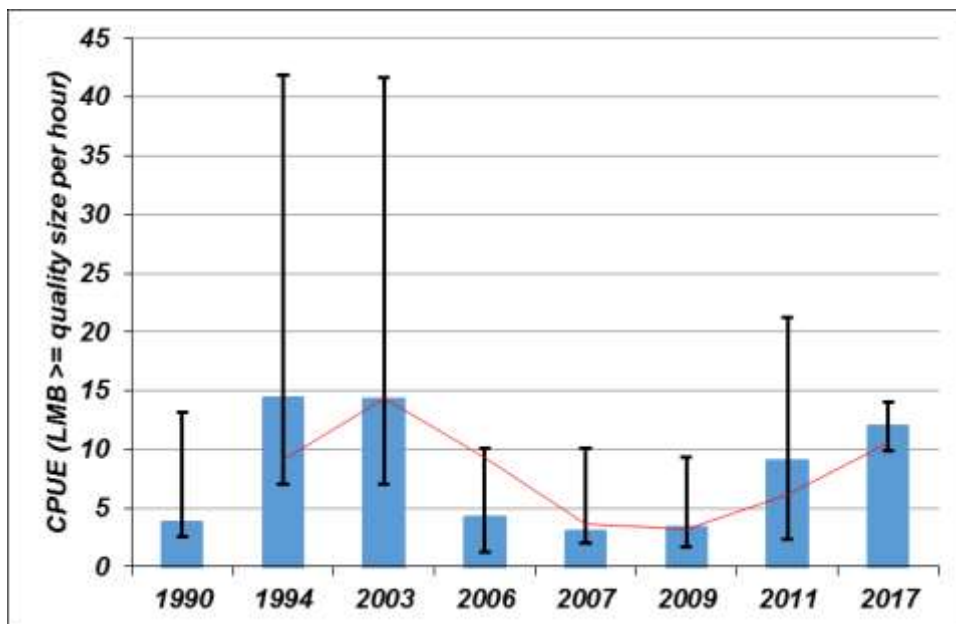


Figure 2. The mean relative abundance ($CPUE \pm SE$) for quality-size LMB collected in electrofishing samples in the Tchefuncte River, Louisiana from 1990 to 2017. * Prior to 2017, samples were collected in the spring and fall. The 2017

samples were collected under the new sampling protocol in the summer.

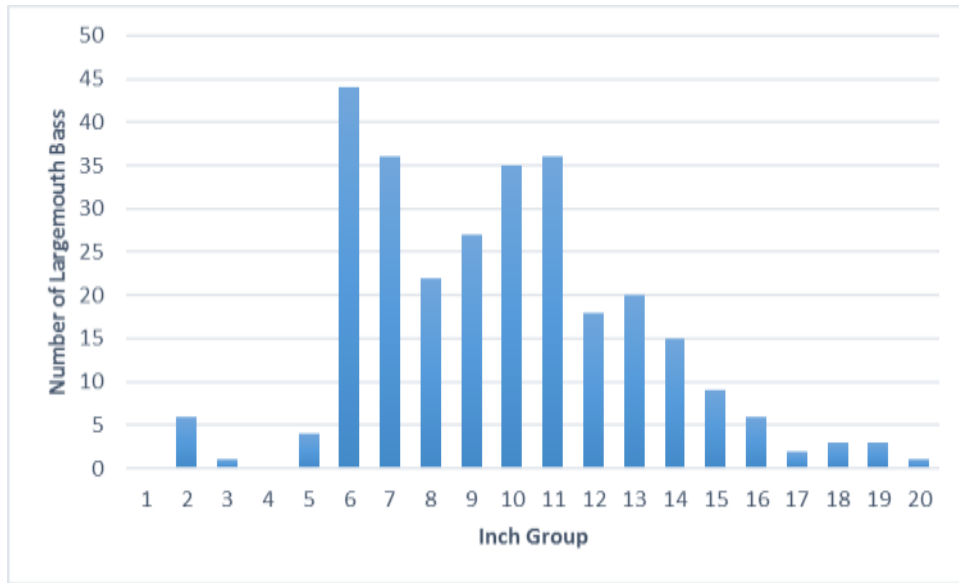


Figure 3. Size distribution by inch group of LMB collected from the Tchefuncte River, Louisiana, in the summer of 2017, n=288.

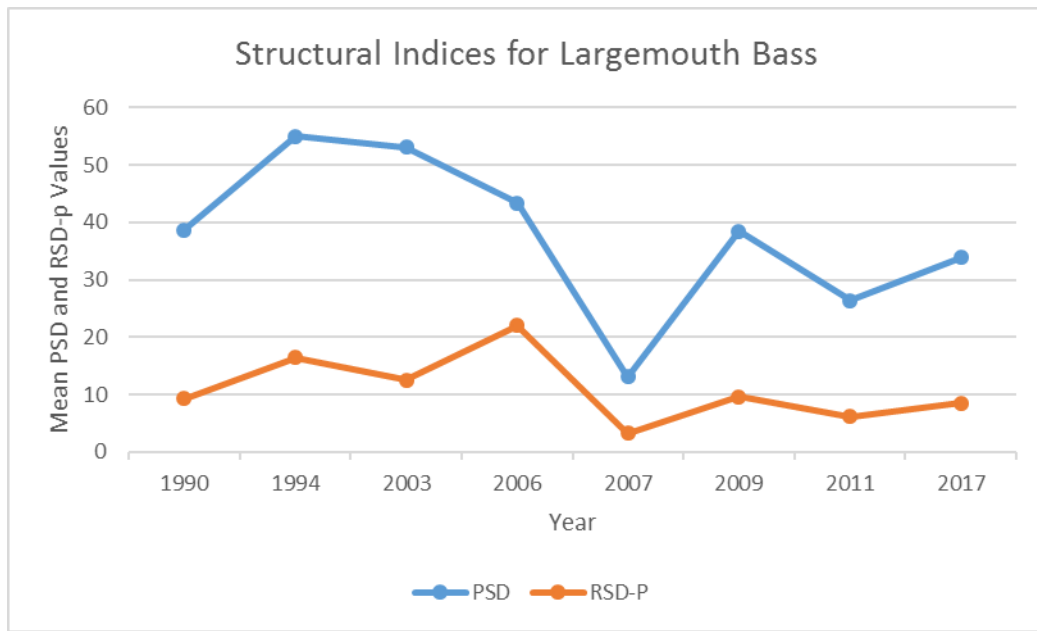


Figure 4. The mean PSD's and RSD-p for LMB collected in electrofishing samples

in the Tchefuncte River, Louisiana from 1990 to 2017. * Prior to 2017, samples were collected in the spring and fall. The 2017 samples were collected under the new sampling protocol in the summer.

Forage –

Forage availability can be measured indirectly by calculating bass body condition or relative weight. Relative weight (Wr) is a measure of a fish's "plumpness" and is the ratio of the fish weight to that of a determined standard weight for a healthy fish. Largemouth bass Wr below 80 may indicate a potential problem with forage availability, while Wr near or above 100 indicates a healthy forage base. Mean relative weight (Wr) of LMB sampled in 2017 ranged from 94.65 to 115.173 and have displayed positive results throughout the year (Figure 5). This indicates that all class sizes of LMB are in fair to good condition, and forage does not appear to be a limiting factor. Crawfish, crabs, river shrimp, grass shrimp and other invertebrates, in addition to common fish species (Table 2), are available as forage to LMB in the Tchefuncte River.

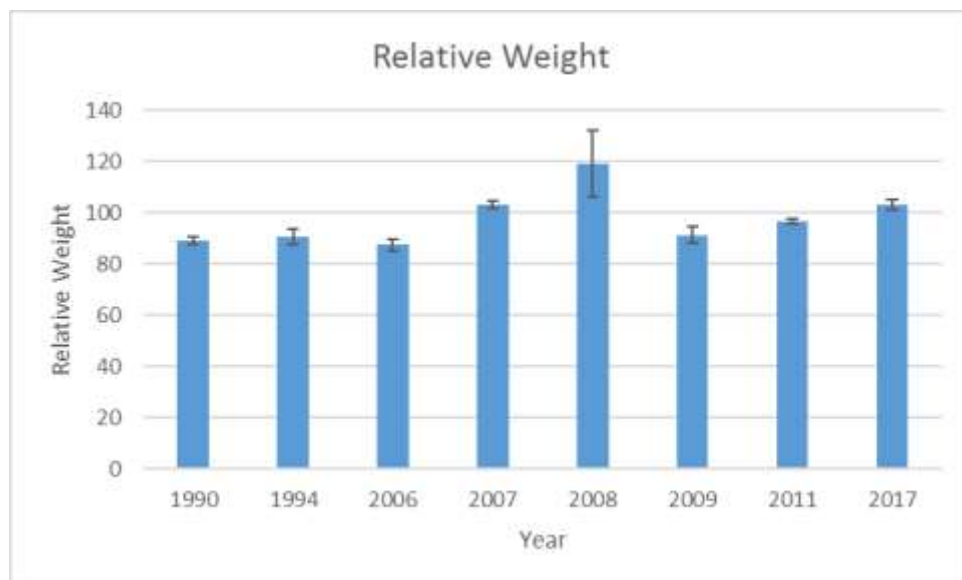


Figure 5. Mean relative weight of stock-size LMB collected in electrofishing samples in the Tchefuncte River, Louisiana from 1990 to 2017. * Prior to 2017, samples were collected in the spring and fall. The 2017 samples were collected under the new sampling protocol in the summer.

Table 2. Available forage for LMB collected in electrofishing samples in the Tchefuncte River, Louisiana in 2017.

Species	CPUE < 6 inch
Bluegill	121.6
Longear Sunfish	61.6

Blacktail Shiner	57.867
Brook Silverside	20
Redear Sunfish	15.733
Threadfin Shad	15.2
Largemouth Bass	14.667
Redspotted Sunfish	9.867
Blackstripe Topminnow	9.867
Warmouth	5.333
Clear Chub	4
Blackspotted Topminnow	3.733
Striped Mullet	2.667
Spotted Bass	2.4
Blacktail Redhorse	1.6
Cherryfin Shiner	1.333
Hogchoker	1.333
Golden Shiner	1.067
Dollar Sunfish	0.8
Black Crappie	0.533
Taillight Shiner	0.533

Genetics -

Although Florida largemouth bass have been stocked into the Tchefuncte River, no genetic data has been collected to date.

Crappie -

Only 15 black and white crappies were collected by LDWF standardized electrofishing in the Tchefuncte River in 2017. Crappie continue to occupy a lower position in the total fish composition of the watershed.

Striped bass-

According to the Gulf States Marine Fisheries Commission (GSMFC), GSMFC 2006 the Tchefuncte River supported the highest abundance of Gulf strain striped bass in Louisiana. However, Monzyk et al. (2001) reported catching only 6 striped bass during 1,798 man-days of gill net sampling in the Tchefuncte River (GSMFC 2006) from 1997-2000. It was concluded that flow in the Tchefuncte River was not sufficient for striped bass spawning (GSMFC 2006). Habitat alterations such as shoreline development, siltation, and canal dredging for real estate access may be responsible for the decrease in striped bass in the Tchefuncte River system.

Phase I and II Gulf strain striped bass were stocked into the Tchefuncte River from 1997-1999 to determine the most efficient stocking methods for this species. Rogillio and Rabalais (2000) reported short term survival rates of 0.07% and 36% for phase I and II Gulf strain striped bass, respectively. No striped bass reproduction has been documented and no specimens have been collected in recent LDWF standardized sampling efforts.

Species Assemblages

Fish Assemblages in the Main Stems of the River Complex

A total of 2,093 fish were collected from the main stems of the Tchefuncte River Complex (Table 3). These samples represent 36 distinct species.

Table 3. Species collected on the main stem of the Tchefuncte River Complex in 2017.

Common Name	Scientific Name	Number
Bluegill	<i>Lepomis Macrochirus</i>	503
Largemouth Bass	<i>Micropterus Salmoides</i>	288
Longear Sunfish	<i>Lepomis Megalotis</i>	248
Blacktail Shiner	<i>Cyprinella Venusta</i>	217
Striped Mullet	<i>Mugil Cephalus</i>	173
Redear Sunfish	<i>Lepomis Microlophus</i>	125
Brook Silverside	<i>Labidesthes Sicculus</i>	75
Threadfin Shad	<i>Dorosoma Petenense</i>	60
Spotted Bass	<i>Micropterus Punctulatus</i>	53
Spotted Gar	<i>Lepisosteus Oculatus</i>	42
Redspotted Sunfish	<i>Lepomis Miniatus</i>	40
Blackstripe Topminnow	<i>Fundulus Notatus</i>	37

Blacktail Redhorse	<i>Moxostoma Poecilurum</i>	30
Warmouth	<i>Lepomis Gulosus</i>	30
Gizzard Shad	<i>Dorosoma Cepedianum</i>	27
Spotted Sucker	<i>Minytrema Melanops</i>	27
Channel Catfish	<i>Ictalurus Punctatus</i>	20
Clear Chub	<i>Hybopsis Winchelli</i>	15
Blackspotted Topminnow	<i>Fundulus Olivaceus</i>	14
Bowfin	<i>Amia Calva</i>	12
Black Crappie	<i>Pomoxis Nigromaculatus</i>	8
White Crappie	<i>Pomoxis Annularis</i>	7
Yellow Bullhead	<i>Ameiurus Natalis</i>	7
Cherryfin Shiner	<i>Lythrurus Roseipinnis</i>	5
Hogchoker	<i>Trinectes Maculatus</i>	5
Freshwater Drum	<i>Aplodinotus Grunniens</i>	4
Golden Shiner	<i>Notemigonus Crysoleucas</i>	4
Dollar Sunfish	<i>Lepomis Marginatus</i>	3
Longnose Gar	<i>Lepisosteus Osseus</i>	3
Shadow Bass	<i>Ambloplites ariommus</i>	3
Blue Catfish	<i>Ictalurus Furcatus</i>	2
Taillight Shiner	<i>Notropis Maculatus</i>	2
Brown Bullhead	<i>Ameiurus nebulosus</i>	1
Carp	<i>Cyprinus Carpio</i>	1
Flathead Catfish	<i>Pylodictis Olivaris</i>	1
Skipjack Herring	<i>Alosa Chrysochloris</i>	1
Total		2093
Shannon's (H') Diversity Index		1.91364
Simpson's (1-D) Diversity Index		0.79094
Species Richness		36

Fish Assemblage in Wadeable Tributaries and Headwaters

A total of 672 fish were collected from 1st, 2nd, 3rd and 4th order streams representing the headwaters through the middle reaches of the complex (Table 4). These samples represent 37 distinct species.

Table 4. Fish species collected during tributary sampling in 2017 in the Tchefuncte River Complex.

Common Name	Scientific Name	Number
Longear Sunfish	<i>Lepomis Megalotis</i>	148

Blackstripe Topminnow	<i>Fundulus Notatus</i>	83
Bluegill	<i>Lepomis Macrochirus</i>	71
Black Banded Darter	<i>Percina Nigrofasciata</i>	62
Dusky Darter	<i>Percina Sciera</i>	46
Gulf Darter	<i>Etheostoma Swaini</i>	34
Blacktail Shiner	<i>Cyprinella Venusta</i>	28
Longnose Shiner	<i>Notropis Longirostris</i>	26
Pirate Perch	<i>Aphredoderus Sayanus</i>	26
Cherryfin Shiner	<i>Lythrurus Roseipinnis</i>	15
Shadow Bass	<i>Ambloplites ariommus</i>	14
Speckled Madtom	<i>Noturus Leptacanthus</i>	13
Western Mosquito Fish	<i>Gambusia Affinis</i>	12
Northern Hog Sucker	<i>Hypentelium Nigricans</i>	11
Spotted Bass	<i>Micropterus Punctulatus</i>	11
Warmouth	<i>Lepomis Gulosus</i>	9
Clear Chub	<i>Hybopsis Winchelli</i>	7
Green Sunfish	<i>Lepomis Cyanellus</i>	7
Banded Pygmy Sunfish	<i>Elassoma Zonatum</i>	6
Brindled Madtom	<i>Noturus Miurus</i>	6
Redspotted Sunfish	<i>Lepomis Miniatus</i>	5
Hogchoker	<i>Trinectes Maculatus</i>	4
Naked Sand Darter	<i>Ammocrypta Beani</i>	4
Largemouth Bass	<i>Micropterus Salmoides</i>	3
Southern Brook Lamprey	<i>Ichthyomyzon Gagei</i>	3
American Eel	<i>Anguilla Rostrata</i>	2
Bantam Sunfish	<i>Lepomis Symmetricus</i>	2
Blacktail Redhorse	<i>Moxostoma Poecilurum</i>	2
Channel Catfish	<i>Ictalurus Punctatus</i>	2
Creek Chubsucker	<i>Erimyzon Oblongus</i>	2
Harlequin Darter	<i>Etheostoma Histrio</i>	2
Speckled Darter	<i>Etheostoma Stigmaeum</i>	2
Brown Madtom	<i>Noturus Phaeus</i>	1
Chain Pickerel	<i>Esox Niger</i>	1
Grass Pickerel	<i>Esox Americanus Vermiculatus</i>	1
Orangespotted Sunfish	<i>Lepomis Humilis</i>	1
Total		672
Shannon's (H') Diversity Index		1.98391
Simpson's (1-D) Diversity Index		0.80019
Species Richness		37

Commercial

The Tchefuncte River supports a small trotline commercial fishery for catfishes. LDWF has not conducted standardized sampling of the Tchefuncte River commercial fishery.

Species of Special Concern

Gulf sturgeon (*Acipenser oxyrinchus desotoi*): The gulf sturgeon is listed as a threatened species by the USFWS and is considered an endangered species in Louisiana. Although most gulf sturgeons in Louisiana are observed in the Pearl River, gulf sturgeon have been caught near the mouth of the Tchefuncte River in Lake Pontchartrain during the winter months. This species has experienced a severe decline in population size over the last several decades. Population decline is a result of habitat destruction, siltation, overfishing and the blocking of waterways. Gulf sturgeons migrate upstream each year to spawn, and the construction of navigational dams has restricted sturgeon from reaching their ancestral spawning grounds. The gulf sturgeon requires very specific spawning habitats that are threatened by development and agricultural practices (Gulf Sturgeon Recovery Plan 1995). http://ecos.fws.gov/docs/recovery_plans/1995/950922.pdf

Paddlefish (*Polyodon spathula*): Although paddlefish were historically abundant throughout the Mississippi River drainage, their numbers have declined in recent years due to habitat alterations, overfishing, and pollution (Ross 2001). The demand for paddlefish roe has created an aggressive commercial fishery. Louisiana does not allow commercial fishing for paddlefish. Recreational anglers are only allowed to keep two incidentally caught paddlefish. Although LDWF does not specifically monitor paddlefish populations in the Tchefuncte River, there is a statewide concern to conserve this ancient species. LDWF, through its Native Fishes in the Classroom Program promotes education and conservation of this species in Louisiana.

Flagfin shiner (*Pteronotropis signipinnis*): The flagfin shiner is found in the headwaters of streams located in the Florida Parishes in southeastern Louisiana. This shiner has become a species of concern as a result of habitat destruction from agricultural and residential development (Ross 2001). Development continues to spread throughout the range of this species.

River redhorse (*Moxostoma carinatum*): R.E. Jenkins (1980) noted nationwide population declines of this species. Researchers believe the decline in this species may have resulted from a decline in the population of native mussels, the primary diet of the river redhorse. In addition, siltation of spawning grounds may have caused a decrease in the number of river redhorse (Ross 2001).

Gulf logperch (*Percina suttkusi*): Although no gulf logperch have been observed in the Tchefuncte River watershed in prior years, two specimens were observed within the Pearl

River watershed in Louisiana during 2010. The current status of the gulf logperch in Louisiana is unknown.

HABITAT EVALUATION

Habitat Evaluation of Tributaries and Headwaters

Habitats were evaluated on the tributaries and the headwater portion of the watershed. A visual-based habitat assessment defined in the EPA's Rapid Habitat Assessment (RHA) protocol was used to rate the quality of the habitat. Most habitats rated in the optimal range (Table 5). Canopy cover parameters and physical parameters including turbidity (NTU), water temperature (c°), dissolved oxygen (ppt), conductivity (u mhos/cm), and velocity (feet/minutes) were collected (Table 5).

Table 5. Habitat data collected during the tributaries sampled in 2017 in the Tchefuncte River Complex.

Site Code	Latitude	Longitude	Temp.	Conductivity	Salinity	Turbidity/NTU	D.O.	Canopy Cover	Total Score(RHA)	Rating (RHA)
4306	30.4823	-90.0267	24.86	0.037	0.02	11.1	5.93	75	144	14.4
4307	30.4856	-90.0093	24.42	0.033	0.02	12.4	6.28	95	178	17.8
4309	30.4941	-90.1699	22.06	0.042	0.02	12.7	7.93	40	106	10.6
4310	30.5342	-90.2036	21.18	0.046	0.02	7.7	7.99	60	142	14.2
4311	30.5562	-90.2204	20.45	0.045	0.02	5.8	7.76	50	128	12.8
4312	30.8194	-90.2905	20.24	0.049	0.02	4.9	7.5	75	138	13.8
4315	30.4915	-90.0754	23.08	0.044	0.02	4.6	7.37	85	149	14.9
4316	30.4997	-90.0635	23.17	0.042	0.02	4.3	7.43	90	138	13.8
4317	30.5336	-90.0562	24.32	0.036	0.02	6.5	7.28	80	148	14.8
4318	30.5244	-90.1131	24.76	0.053	0.02	6.2	7.74	50	123	12.3
4319	30.5567	-90.1461	24.64	0.033	0.01	5.9	7.91	75	123	12.3
4320	30.5849	-90.1490	19.57	0.034	0.01	5.5	7.85	90	132	13.2
4321	30.6286	-90.1714	19.88	0.033	0.01	4.8	7.54	80	129	12.9

Aquatic Vegetation

Giant salvinia (*Salvinia molesta*) was discovered in the Tchefuncte watershed in 2014. The invasive species is currently being managed and monitored on a regular basis. Infestations of giant salvinia persist in the shallow marshes east and west of the Tchefuncte River. Access to these areas is limited to surface drive or air boats. In addition, water lettuce (*Pistia stratiotes*) is being managed in response to resident complaints. Although aquatic plant issues do not typically restrict access in these areas, common salvinia, giant salvinia, water hyacinth, duckweed, and alligator weed have been the primary focus of nuisance aquatic plant control efforts in the system (Table 6).

Table 6. Area (acres) of aquatic nuisance vegetation sprayed by year (2010 – 2017) and species on the Tchefuncte River, LA.

	2010	2011	2012	2013	2014	2015	2016	2017	Total
Alligator Weed	0	20	14	0	6	18.7	35	47	140.7
Pennywort	3	8	0	0	0	0	8	0	19
Primrose	9	0	0	0	5	0.06	24	3.5	41.56
Common Salvinia	6	9	2	17	31	13.03	9	24	111.03
Duckweed	0	0	0	3	0	0	0	0	3
Water Hyacinth	5	0	0	0	84		115.75	109	313.25
Giant Salvinia	0	0	0	0	4	5.06	0	57	66.06
Total	23	37	16	20	130	36.85	191.75	240	694.6

Substrate

The substrate consists of sand, gravel, and organic material.

Dams, Weirs, and Reservoirs

There are currently no dams, weirs or reservoirs on the river.

CONDITION IMBALANCE / PROBLEM

Habitat alterations such as shoreline development, siltation, and canal dredging for real estate access may be responsible for the decline of several fish and mussel species in the Tchefuncte River system. The flagfin shiner is found in the headwaters of streams located in the Florida Parishes. This shiner has become a species of concern as a result of habitat destruction from agricultural and residential development (Ross 2001).

Researchers believe the decline in the river redhorse population may have resulted from siltation of spawning habitat and a decline in native mussels within the watershed (Ross 2001).

A fish consumption advisory is in effect for the Bogue Falaya and Tchefuncte Rivers. Primary water contact (swimming) advisories exist for the Tchefuncte River, the Bogue Falaya River, and bordering waters, due to excessive levels of the *Escherichia coli* bacterium.

CORRECTIVE ACTION NEEDED

Increased coordination between appropriate agencies, non-governmental organizations, and other interested parties are needed to identify and remediate habitat alterations within the watershed.

RECOMMENDATIONS

1. Continue treating nuisance aquatic vegetation with chemical and biological controls as necessary and according to the LDWF approved Aquatic Herbicide Application Procedures.
2. Continue the use of existing recreational harvest regulations until LDWF sampling results indicate that change is necessary from a biological perspective, or such time as a change in management strategy is indicated by the collective opinion of area anglers.
3. Continue scheduled rivers and stream sampling protocol on a four-year rotation of fish populations and habitat evaluation

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